

Thysanotus admirabilis Jian Wang ter (Laxmanniaceae), a remarkable new species from western Queensland, Australia

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Summary

Wang J. & Silcock J. (2022). *Thysanotus admirabilis* Jian Wang ter (Laxmanniaceae), a remarkable new species from western Queensland, Australia. *Austrobaileya* 12: 14–18. *Thysanotus admirabilis* Jian Wang ter is described and is distinguished by the lanate flower buds and perianth, and sometimes by the lanate bracts. The new species is known only from Mariala National Park and adjacent areas of the neighbouring grazing property ‘Varna’, western Queensland. Notes are provided on distribution, habitat, phenology and affinities of the newly described species and its conservation status discussed. A key to *Thysanotus* species in Queensland is provided.

Key Words: Laxmanniaceae; *Thysanotus*; *Thysanotus admirabilis*; Australia flora; Queensland flora; taxonomy; new species; identification key; conservation status

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Introduction

The genus *Thysanotus* R.Br., commonly known as fringe lilies, includes 54 species and one subspecies to date (CHAH 2020; Govaerts *et al.* 2022). *Thysanotus* has had various family placements over the past decades, including Liliaceae (Brittan 1981, 1987), Anthericaceae (Chase *et al.* 1995) and Laxmanniaceae (Chase & Stevens 1998; Wang 2021). The genus is more often placed in the family Asparagaceae under subfamily Lomandroideae as recently circumscribed (Chase *et al.* 2009; Gunn *et al.* 2020; Macfarlane *et al.* 2020; Govaerts *et al.* 2022). The family Laxmanniaceae is retained here following the family systematics applied at BRI.

Thysanotus is mainly found in Australia, with two species (*T. banksii* R.Br. and *T. chinensis* Benth.) extending to New Guinea. The latter of these is also distributed in China, Thailand, Vietnam, the Malay Peninsula, the Philippines, Lesser Sunda Islands, Celebes and Aru Island (Brittan 1981, 1987).

Currently, there are three species and a subspecies recognised as occurring in Queensland, namely: *Thysanotus banksii*, *T. chinensis*, *T. tuberosus* R.Br. subsp. *tuberosus* and *T. tuberosus* subsp. *parviflorus* (Benth.) Brittan (Wang 2019). A taxonomic review of *Thysanotus* in Queensland north-eastern Australia by the senior author and P. Forster is underway.

The first collection of the taxon described here, with flower buds and near mature flowers, was made by C. Pennay and S. Hudson who were conducting flora surveys for the Queensland Spatial BioCondition project in June 2019. Their specimen was brought to the senior author’s attention. Subsequently, Tracy Wattz, the Queensland Parks and Wildlife Service and Partnerships ranger of Mariala National Park, collected specimens in October 2021 on our request. Two months later, J. Silcock and R. Fairfax collected the type specimen and made a preliminary conservation investigation of the new species.

Materials and methods

This study is based on morphological examination of *Thysanotus* material from the following herbaria: BRI, CANB, CNS, DNA, MEL, NE, NT, PERTH. All measurements

are based on dried material, except the dimensions of florets, which are based on material reconstituted with boiling water. Dimensions of measurements are inclusive, i.e. 1.0–1.8 is given as 1–1.8.

Taxonomy

Key to *Thysanotus* species in Queensland

- 1 Roots fibrous, rhizome small; inflorescence a terminal umbel. **T. chinensis**
1. Roots tuberous, tubers cylindrical to ellipsoidal; inflorescence simple to paniculate with few to more than 20 umbels. **2**
- 2 Flower buds, perianth at anthesis and sometimes bracts lanate **T. admirabilis**
2. Flower buds, perianth at anthesis and bracts glabrous **3**
- 3 Inflorescence simple or with 1–3 branches; antisepaline anthers bright yellow with light purple or violet tips, 2–2.8 mm long. **T. banksii**
3. Inflorescence paniculate and usually much branched; antisepaline anthers light purple, purple or violet with white to pale yellow base, 4–5 mm long. . **T. tuberosus**

Thysanotus admirabilis Jian Wang ter sp. nov.

With affinity to *T. tuberosus* R.Br., but differing in the lanate flower buds, perianth and sometimes bracts; yellow anthers with creamy to light purple or purple tips; obovoid and longer seeds. Differing from all other species of the genus in the lanate flower buds and perianth and sometimes the lanate bracts.

Typus: Australia. Queensland. WARREGO DISTRICT: Marijala National Park, off eastern boundary, 16 December 2021, *J. Silcock & R. Fairfax JLS2332* (holo: BRI [AQ952631]).

Perennial geophytic herb, tufted and clumping; rootstock tuberous, tubers cylindrical to ellipsoidal, 1.6–2.5 cm long, 0.5–1 cm diameter, 20–30 cm from stem base. Leaves 20–40, annual, basal, linear, ± terete towards apex, becoming channelled below with narrow membranous wings, 250–370 mm long, 0.5–1 mm wide, longitudinally veined when dry, glabrous; leaf sheath margins membranous, entire, 50–80 mm from the base, 0.4–1 mm wide; leaf apex obtuse. Each plant usually has 2 or 3(–6) inflorescences. Inflorescence paniculate with 6–10 branches, 26–41 cm long; branched 7–25 cm from the base, branches 1 or 2(–4) per node, 3.5–18 cm long, ascending; axes (stems and branches) terete or

slightly flattened-terete in lower part, ridged with the ridges becoming more prominent distally. Umbels more than 20, terminal on branches and stems; bracts of branches long-to short-deltoid, (2–)5–33 mm long, 1–2.5 mm wide at base, green with a purplish to whitish membranous margin, glabrous to minutely hairy; bracts of umbels short-deltoid, 3–4 mm long, 1.5–2 mm wide at base, purplish with a wide and whitish membranous margin, minutely to densely lanate hairy. Flowers 1–3, of different ages for each umbel, occasionally sessile ones below; umbels on old stems with 1 or 2 pedicel remnants; pedicels 7–16 cm long at anthesis, articulate 1.5–9 mm (less than one fifth to slightly more than halfway) from the base, mostly erect in flower and fruit. Flower buds lanate hairy. Perianth 13–15 mm long, excluding fringes. Sepals lanceolate, 1.8–2.2 mm wide, purple with creamy margins on upper surface, light green, and covered with lanate hairs on the under surface, not obviously veined, the apex obtuse, apiculate, mucro *c.* 1 mm long. Petals broad ovate to elliptic, 10–14 mm wide including fringes, the marginal fringe well-developed, 3.8–4.4 mm long, dense, of even length throughout except much shorter at base of petal, overall purple, with a darker purplish central strip on upper surface. Stamens 6, surrounding ovary, the

outer (antisepaline) and inner (antipetaline) whorls similar in colour and shape, but unequal in length; filaments 1.6–2 mm long; outer anthers, upright, 5–5.5 mm long, 0.4–0.5 mm wide, yellow with creamy to light purple tips, the pores *c.* 0.5 mm long; inner anthers, lanceolate, slightly curving inward, 8.5–9 mm long, 0.4–0.5 mm wide at the base, yellow with creamy to light purple or purple tips, the pores *c.* 0.4 mm long; both outer and inner anthers more or less twisted. Ovary spherical, 1.2–1.3 mm diameter, pale with 2 ovules per locule; style terminal, 8.5–9 mm long; light purple, straight, bent to one side near tip, well-separated from the stamens, the stigma facing the anther apices. Capsule \pm spherical or obovoid, 6–6.5 mm long, 5–6 mm wide, enclosed within persistent perianth segments adhering above. Seeds obovoid with a narrow end, 2.5–2.6 mm long, 1.4–1.6 mm wide, black, partially covered with an orange aril, *c.* 2 mm long, 1.5 mm wide. **Fig. 1.**

Additional specimens examined: Queensland. WARREGO DISTRICT: Mariala National Park, approximately 100 m west from eastern side boundary track, Jun 2019, Pennay & Hudson CP805 (BRI); Mariala National Park, off eastern boundary, Oct 2021, Watz *s.n.* (BRI [AQ952630]).

Distribution and habitat: *Thysanotus admirabilis* is endemic to the Warrego Pastoral District which lies in the Mulga Lands biogeographic region of western Queensland (DAWE 2012). Currently, it is known only from Mariala National Park and adjacent areas of the neighbouring grazing property ‘Varna’. It grows in water run-on areas of mulga (*Acacia aneura* F.Muell. ex Benth.) low woodland with scattered poplar box (*Eucalyptus populnea* F.Muell.) and shrubs including silver turkey-bush (*Eremophila bowmanii* F.Muell.) and emu bush (*E. longifolia* (R.Br.) F.Muell.) on reddish brown earth (**Fig. 1d**). Associated species include *Aristida contorta* F.Muell., *Brachyscome ciliaris* (Labill.) Less., *Calandrinia eremaea* Ewart, *Convolvulus clementii* Domin, *Digitaria brownii* (Roem. & Schult.) Hughes, *Dysphania glomulifera* (Nees) Paul G.Wilson, *Erodium crinitum* Carolin, *Fimbristylis dichotoma* (L.) Vahl, *Goodenia glabrata* (Carolin) K.A.Sheph., *G. havilandii* Maiden & Betche, *Enneapogon*

polyphyllus (Domin) N.T.Burb., *Euphorbia boophthona* C.A.Gardner, *Monachather paradoxus* Steud., *Paspalidium rarum* (R.Br.) Hughes, *Phyllanthus virgatus* G.Forst., *Polygala triflora* L., *Ptilotus modestus* T.Hammer, *Stenopetalum nutans* F.Muell., *Trachymene cyanantha* Boyland and *Tripogon loliiformis* (F.Muell.) C.E.Hubb.

Phenology: Flowering was recorded in June and October to December, and mature fruit in December. The June 2019 collection followed above-average autumn rainfall, while the 2021 collections followed average winter rainfall and above-average spring rainfall BOM (2022).

Notes: *Thysanotus admirabilis* is the most outstanding species in this genus on account of its lanate hairy flower buds and perianth, together with sometimes lanate hairy bracts. These characteristics makes it easily distinguishable. *Thysanotus tuberosus* has also been recorded from Mariala National Park within 2 km of *T. admirabilis*, but it was typically found on harder, stonier mulga areas. *Thysanotus admirabilis* can be easily distinguished from *T. tuberosus* by, apart from the lanate hairy flower buds and perianth and sometimes the hairy lanate bracts, its leafy habit and yellow anthers with creamy to light purple or purple tips (anthers are light purple, purple or violet with white to pale yellow base for *T. tuberosus*).

Conservation status: *Thysanotus admirabilis* is currently only known from a small area of Mariala National Park and a neighbouring grazing property in western Queensland, Australia. Extent of Occurrence (EOO) and Area of Occupancy (AOO), as calculated in the IUCN Geocat program using a 2 km grid cell, are both 4 km². The species population comprises a single subpopulation and location (IUCN 2019). It occurs patchily for at least 1 km along the eastern boundary of Mariala National Park on both sides of the fence. Average density was conservatively estimated as 50 plants/ha in December 2021, thus within the 100 ha (1 km²) over which the species is known to occur, total population size is conservatively estimated as 5000 plants.



Fig. 1. *Thysanotus admirabilis*. A. face view of flower, together with buds. B. side view of flower, together with buds. C. plant habit. D. plants in habitat. All at the type locality. Photos: J. Silcock.

The habitat is in good condition and has never been cleared. No weeds were present at the site. Cattle were present on the grazing property in December 2021, but no *Thysanotus admirabilis* plants were grazed. One plant on Mariala National Park had been lightly grazed, apparently by a macropod.

Despite its very small known EOO, AOO and population size, the species is not eligible for listing under IUCN criteria B or C, as there is no evidence of continuing decline in any population or habitat parameters (IUCN

2019). Total population size is estimated to be >3000 mature individuals, so the species is not eligible for listing under criterion D1. As there are no obvious threats that could conceivably drive the species to CR or EX in a very short time, which is needed to list as Vulnerable under criterion D2, a conservation listing of Least Concern is recommended under the IUCN (2019) guidelines. Further targeted surveys across Mariala National Park and surrounding areas after above-average rainfall are warranted. Mariala National Park is relatively well-collected botanically;

however, the species is geophytic and cryptic when not in flower. It is probably only present above ground for short time periods following rain.

Etymology: The specific epithet is derived from the Latin for ‘admirable’, worthy of admiration. It refers to the surprising and astonishing appearance of the flower perianth, which is covered with white hairs. This characteristic distinguishes the species from all others in the genus.

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